

CLAIMS

We claim:

1. An isolated DNA molecule comprising a plant promoter region, wherein the promoter region is a seed-specific promoter region and is selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12.
2. The DNA molecule of Claim 1, further comprising a heterologous gene operably linked to the promoter region.
3. The DNA molecule of Claim 2, further comprising a termination sequence.
4. An expression vector, comprising the DNA molecule of Claim 2.
5. A transgenic plant cell, comprising the DNA molecule of Claim 2.
6. A transgenic plant, comprising the DNA molecule of Claim 2.
7. A transgenic seed, comprising the DNA molecule of Claim 2.
8. An isolated DNA molecule comprising a plant promoter region which hybridizes under high stringency to a sequence selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12, and which is effective as a seed-specific promoter.
9. An isolated DNA molecule comprising a plant promoter region which is a fragment of one of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set

forth in Figures 1-12, and which is effective as a seed-specific promoter.

10. An isolated DNA molecule comprising a plant promoter region which is a modification of one of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12, and which is effective as a seed-specific promoter.

5 11. A method for identifying a seed-specific promoter, comprising:

- a) providing sequences for a set of ESTs, wherein the ESTs are expressed in developing plant seed tissue;
- b) analyzing the ESTs by micro array analysis to select a subset of ESTs which are preferentially expressed in developing plant seed tissues;
- 10 c) selecting at least one EST of the subset of ESTs;
- d) identifying a genome sequence which corresponds to the at least one EST;
- e) analyzing a 5' flanking sequence of the genome sequence to identify a seed-specific promoter region.

12. The method of Claim 12, further comprising:

- 15 f) characterizing the effectiveness of the identified promoter region to specifically express a gene in a transgenic plant seed tissue.

13. A method for identifying a seed-specific promoter, comprising:

- a) providing at least a partial genomic sequence of a plant;
- 20 b) analyzing the sequence for regions which are homologous to at least one nucleic acid sequence selected from the group consisting of the SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12, to identify a seed-specific promoter region.

14. The method of Claim 13, further comprising:

- c) characterizing the effectiveness of the identified promoter region to specifically express a gene in a transgenic plant seed tissue.

15. A method for identifying a seed-specific promoter, comprising:

- a) providing at least a partial first genomic sequence of a first plant;
- b) analyzing the first genomic sequence for regions which are homologous to regions of a second genomic sequence of a second plant, wherein the second plant is Arabidopsis and wherein the regions are selected from the group of regions consisting of 65,745—66103, 32165—32525, 2559—243, 67515—67,329, 67229—67048, 27,709—28066, 8408—8025, 68,590—68226, 82,725—82350, 18,058—17673, 52,852—52660, 52,589—52400, 52,096—52,065, 14,510—14,37, 14,289—14,106, 14,033—13,975, 73,712—73,648, 72,555—73,400, and 73,308—73,153.
- c) identifying at least one first region from the first plant genomic sequence with homology to at least one second region of the second plant genomic sequence;
- d) identifying a 5' flanking sequence to the first region from the first plant genomic sequence to identify a seed-specific promoter region.

16. The method of Claim 15, further comprising:

- e) characterizing the effectiveness of the identified promoter region to specifically express a gene in a transgenic plant seed tissue.

17. A method of producing a product of interest in a plant seed, comprising:

- a) providing a transgenic plant comprising a nucleic acid sequence encoding the product of interest operably linked to a promoter region, wherein the

promoter region which is a seed-specific promoter region and is selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12; and

- b) growing the plant under conditions such that the product is produced in a seed of the plant.

18. A method of producing a protein of interest in a plant seed, comprising:

- a) providing a transgenic plant comprising a nucleic acid sequence encoding the protein of interest operably linked to a promoter region, wherein the promoter region is a seed-specific promoter region and is selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12; and
- b) growing the plant under conditions such that the protein is produced in a seed of the plant.

19. A method of expressing a nucleic acid sequence of interest in a plant seed, comprising:

- a) providing a transgenic plant comprising a nucleic acid sequence encoding the product of interest operably linked to a promoter region, wherein the promoter region is a seed-specific promoter and is selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, as set forth in Figures 1-12; and
- b) growing the plant under conditions such that the nucleic acid sequence is expressed in a seed of the plant.

20. An isolated DNA molecule comprising a plant promoter region, wherein the promoter region is a seed-specific promoter and is selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 10, and 12, as set forth in Figures 1, 2, 3, 4, 10, and 12.

21. The DNA molecule of Claim 20, further comprising a heterologous gene operably linked to the plant promoter.
22. The DNA molecule of Claim 21, further comprising a termination sequence.
23. An expression vector, comprising the DNA molecule of Claim 21.
- 5 24. A transgenic plant cell, comprising the DNA molecule of Claim 21.
25. A transgenic plant, comprising the DNA molecule of Claim 21.
26. A transgenic seed, comprising the DNA molecule of Claim 21.

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